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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/764,024

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You Kondoh

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04/13/2004

PATENT LAW GROUP LLP
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EXAMINER

WILLE, DOUGLAS A

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 04/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/764,024

Applicant(s)

KONDOH ET AL.

Examiner

Douglas A Wille

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5,6,9-15,17,36 and 38-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,6,9-15,17,36,38-46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 - 3, 5, 6, 9 - 13, 15, 17, 36, 38 - 43 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. in view of Kitagawa et al. and Mitsui.
3. With respect to claims 1 and 36, Nakamura et al. show a GaN LED (see cover Figure and column 3, line 40 et seq.) with a p-contact that could be Ag (column 6, line 66) but does not show further layers. Kitagawa et al. show a luminescent device (see cover Figure and column 3, line 30 et seq.) that has a p-electrode 16 and a protective film 17 that protects the electrode from deterioration (column 5, line 10). Note that Kitagawa et al. show that layer 17 can include ZnS or ZnSSe (column 5, line 10) which is a semiconductor and is therefore conducting and how well it conducts depends on the density of the included material. Since Ag is also subject to deterioration it would have been obvious to provide a protective film on the Nakamura et al. device. Mitsui shows (see constitution) that for a solar cell a layer of Au on Ag will prevent deterioration of the Ag. It would have been obvious to protect the electrode as shown by Kitagawa et al. and to use Au as the protective film since it is easier to form than the semiconductor layer of Kitagawa et al. With respect to the 50% reflectivity, it would have been obvious to make the Ag layer have the maximum reflectivity possible and this maximum value is

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a function of the LED material and the Ag electrode. Note that Kitagawa et al. show a vertical extension of layer 16 which can be considered as a bonding layer.

4. With respect to claim 2, Nakamura et al. show a group III nitride.
5. With respect to claim 3, it would be obvious to make the Ag layer thick enough to be reflective.
6. With respect to claims 5 and 6, the protective film is Au.
7. With respect to claim 9, Kitagawa et al. shows layer 16 can be Au (column 4, line 48).
8. With respect to claim 10, the bonding layer is less than half the Ag.
9. With respect to claim 11, it would have been obvious to use a multilayer structure to balance adhesion and resistivity.
10. With respect to claim 12, the fixation layer is between the bonding layer and the Ag layer.
11. With respect to claim 13, the fixation layer is metal.
12. With respect to claim 15, layer 17 of Kitagawa et al. encapsulates 16.
13. With respect to claim 17, there is a package with p- and n-electrodes.
14. With respect to claim 38, Nakamura et al. show a GaN LED (see cover Figure and column 3, line 40 et seq.) with a p-contact that could be Ag (column 6, line 66) but does not show further layers. Kitagawa et al. show a luminescent device (see cover Figure and column 3, line 30 et seq.) that has a p-electrode 16 and a protective film 17 that protects the electrode from deterioration (column 5, line 10). Note that Kitagawa et al. show that layer 17 can include ZnS or ZnSSe (column 5, line 10) which is a semiconductor and is therefore conducting and how well it conducts depends on the density of the included material. Since Ag is also subject to

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deterioration it would have been obvious to provide a protective film on the Nakamura et al. device. Mitsui shows (see constitution) that for a solar cell a layer of Au on Ag will prevent deterioration of the Ag. It would have been obvious to protect the electrode as shown by Kitagawa et al. and to use Au as the protective film since it is easier to form than the semiconductor layer of Kitagawa et al. With respect to the 50% reflectivity, it would have been obvious to make the Ag layer have the maximum reflectivity possible and this maximum value is a function of the LED material and the Ag electrode. Note that Kitagawa et al. show a vertical extension of layer 16 which can be considered as a bonding layer.

15. With respect to claims 39 – 41, the metal is Ag, the device is GaN the electrode is on the GaN and the barrier contacts the GaN.

16. With respect to claims 42 and 43, the protective layer covers the electrode except where it sticks through the layer and covers the edge.

17. With respect to claim 45, the protective layer is a metal.

18. Claims 14 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. in view of Kitagawa et al. and Mitsui and further in view of Hatano et al.

19. Hatano et al. show that for GaN (column 27, line 35) an Ag and Ni laminate can be used as a p-electrode and since Ag is known to need protection it would have been obvious to use the Ag/Ni laminate as an electrode material as a design alternative.

20. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. in view of Kitagawa et al., Mitsui and further in view of Shibata.

21. Shibata shows that for a p-electrode, the electrode layer has a separate bond pad for external connection (see cover Figure and column 2, line 63 et seq.). It would have been obvious

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to form the p-electrode over the whole surface and to add the pad layer for external connection to avoid damage to the electrode layer and to avoid interference with the optical characteristics of that layer (column 3, line 43).

Response to Arguments

22. Applicant's arguments filed 1/27/04 have been fully considered but they are not persuasive.

23. Applicant states that the protective layer 17 of Kitigawa et al. is not conducting, which is true but Kitagawa et al. show the use of semiconducting materials, which are conducting, and the conductivity will be a function of the density of the included material. With sufficient density the included material will form a continuous matrix and will conduct. Nevertheless, Kitaigawa et al. does suggest the use of a conducting material.

24. Applicant states that Kitigawa et al. and Mitui cannot be combined since they use protective layers for different puposes but note that both show protection from the atmosphere.

25. Applicant states that neither Kitigawa et al. nor Mitsui show the prevention of migration but this is a functional limitation and carries no weight.

Conclusion

26. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas A Wille whose telephone number is (571) 272-1721. The examiner can normally be reached on M-F (6:15-2:45).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Douglas A. Wille
Primary Examiner